CS1114 Function Design Recipe Problem Set

January 30, 2025

Instructions:

- Every student must submit his or her own submission for credit.

- Questions do not necessarily appear in order of difficulty

- Each solution should be thoroughly **designed**, following each step of the design recipe in detail.

1. **Classroom Temperatures**

   You're helping a school monitor classroom temperatures. Each classroom has a unique name and a temperature reading in Celsius. Write a function to determine if a given classroom's temperature is above 80 degrees Fahrenheit.

2. **Password Strength**

   You are developing a simple system for checking password strength. Determine if a given password is considered strong based on its length. A password is considered strong if it has more than twelve characters.

3. **Tree Rings and Age**

   The ages of trees are measured by their rings, with the size of the ring indicating the age of the tree. Create a function that, for the number of full years a tree has completed since germination, produces an image of a brown ring (an outline of a circle) representing a tree of that age. In this representation, the distance from the center of the tree to the outermost bark grows at ten pixels per year.

4. **Personalized Award Certificates**

   You're assisting a school in creating personalized award certificates for students who won a gold star. Every student gets the same certificate and emblem, but each certificate should be printed with that student's name on it. Generate a certificate with an appropriate emblem and the student's name.

5. **Watermarking Tool**

   A photographer wants to watermark their photographs before sharing them online. Design a function that takes a photograph (image) and a string of text for the watermark as inputs. The function should overlay the watermark text at the bottom right corner of the photograph.

6. **Absolute Value Calculator**

   You're helping a math tutoring center develop tools for students to practice math operations. Design a function that takes a number as input and returns its absolute value.

7. **Room Area**

   You're considering renting an apartment, but the room dimensions are in feet and inches (like 5" 6') while your belongings are measured using the metric system. Design a function named room-dims-cm that consumes four numbers, respectively length of two sides of a room in feet and inches, respectively, and tells you the area of the room in square centimeters.

8. **Tasty Beverages at a Party**

   You're hosting a party and notice a pattern in beverage consumption among your CS 1114 classmates. Each of your CS 1114 classmates consumes two beverages at the party, while all other guests consume only one. Given the initial number of beverages, the number remaining post-party, and the total number of attendees, design a function named schemers-at-party to compute the number of CS 1114 students who attended your party.